AMENDMENTS TO THE CLAIMS

1. (Currently amended) A method ~~to create~~ of creating a digital model of a patient's teeth, comprising:

   taking an impression of the patient's teeth using a dental impression system <u>configured</u> <u>to improve the quality of scanned data from a dental impression,</u> the system including an impression material and a dental tray adapted to hold the impression material, <u>the dental tray made of a tray material, each of the impression and tray</u> <u>materials having a respective radiopacity, at least one of the materials being</u> <u>formulated with a radiopaque agent such that the respective radiopacities of the</u> <u>materials approximately match each other</u> ~~the impression material having a given~~ ~~x-ray attenuation factor, the tray comprising a thermoplastic resin compounded~~ ~~with at least one radiopaque agent, the dental tray having an attenuation factor~~ ~~not exceeding a level 50% greater than that of the impression material;~~

   scanning the impression and the dental tray using a radiographic source; and

   generating the digital model with scanned data.

2. (Original) The method of claim 1, further comprising passing a radiation source through a scintillator.

3. (Original) The method of claim 2, further comprising digitizing the output of the scintillator.

4. (Original) The method of claim 1, wherein the impression of the teeth is taken in a dental tray having detachable portions.

5. (Currently amended) The method of claim 1, further comprising taking a bite impression of the patient<u>.</u>

6. (Original) The method of claim 5, wherein the bite impression is taken using a PVS material.

2

7.   (Original) The method of claim 5, wherein the bite impression is taken using a wax bite.

8.   (Currently amended) The method of claim 1, wherein an upper teeth impression, a lower teeth impression, and a bite impression is are scanned together.

9.   (Original) The method of claim 8, further comprising digitally reversing data from the upper and lower impression scan data to make positive data.

10.   (Original) The method of claim 9, wherein the digital reversing identifies inner surfaces of an impression material and extracting the inner surfaces using a largest connected component algorithm.

11.   (previously presented) The method of claim 1, further comprising aligning data into a bite position using the impression material scanned.

12.   (Original) The method of claim 1, further comprising digitally detailing the teeth data.

13.   (Original) The method of claim 1, further comprising setting a final bite.

14.   (Original) The method of claim 1, further comprising articulating the digital model.

15.   (Currently amended) A system to create a digital model of a patient's teeth from scanned data of improved quality, comprising:
      a dental tray adapted to hold an impression material, the impression material having a given x-ray attenuation factor, the tray including a thermoplastic resin compounded with at least one radiopaque agent, the dental tray having an attenuation factor not exceeding a level 50% greater than that of the impression material; the dental tray made of a tray material, each of the impression and tray materials having a respective radiopacity, at least one of the materials being formulated with a

3

radiopaque agent such that the respective radiopacities of the materials approximately match each other;

a radiation source;

a scintillator to receive the radiation from the radiation source; a radiation detector coupled to the scintillator;

a rotatable table positioned between the radiation source and the scintillator, the table being adapted to support the dental tray with the impression of the patient's teeth; and

a computer coupled to the detector to generate the digital model with scanned data.

16.   (Original) The system of claim 15, wherein the radiation source is an X-ray source.

17.   (Original) The system of claim 15, wherein the radiation source is a computed tomography source.

18.   (Original) The system of claim 15, wherein the rotatable table is adapted to support an upper teeth impression, a lower teeth impression and a bite impression.

19.   (Original) The system of claim 15, further comprising a fabrication machine coupled to the computer to generate a plurality of appliances, wherein the appliances comprise polymeric shells having cavities and wherein the cavities of successive shells have different geometries shaped to receive and resiliently reposition the teeth from one arrangement to a successive arrangement.

20.   (Original) The system of claim 15, wherein the dental tray comprises: a base having a plurality of prongs, the base having one or more openings to allow flowing of the dental impression material; a first wall extending from one side of the base, the first wall having one or more openings to allow flowing of the dental impression material; and at least one detachable portion formed on one end of one prong, the detachable portion being removable to shorten the prong length.

4

21-32. (Cancelled)

33. (New) A method of improving the quality of scanned data from a dental impression made with a dental impression material in a dental tray, the tray made of a material, the method comprising formulating at least one of the dental impression material and the dental tray material with a radiopaque agent such that the respective radiopacities of the impression and tray materials approximately match each other.

34. (New) The method of claim 33, wherein the radiopacity of the dental tray material is formulated to match the radiopacity of the dental impression material.

35. (New) The method of claim 33, wherein the radiopacity of the dental impression material is formulated to match the radiopacity of the dental tray material.

36. (New) The method of claim 33, wherein the radiopacity of the dental tray does not exceed the radiopacity of the dental impression material by more than 50%.

37. (New) The method of claim 33, wherein the dental tray material is formed from a thermoplastic resin, and wherein radiopacity of the dental impression tray is adjusted by compounding a radiopaque agent into the thermoplastic resin.

38. (New) The method of claim 33, wherein the radiopaque agent included in the dental tray material is any of barium sulfate, calcium carbonate, calcium chloride, sodium carbonate, magnesium sulfate, bismuth trioxide, bismuth subcarbonate, bismuth oxychloride and the heavy metal powder tungsten, gold, platinum, or silver.

39. (New) The method of claim 33, wherein the dental impression material is an elastomeric material, the elastomeric material being any of an irreversible hydrocolloid, a reversible hydrocolloid, a polysulfide, a polyether, a condensation reaction silicone, or an addition

5

reaction silicone, and wherein the radiopacity of the impression material is adjusted by directly compounding a radiopaque agent into the impression material.

40. (New) The method of claim 33, wherein the dental impression material is an elastomeric material, the elastomeric material being any of an irreversible hydrocolloid, a reversible hydrocolloid, a polysulfide, a polyether, a condensation reaction silicone, or an addition reaction silicone, and wherein the radiopacity of the impression material is adjusted by applying a layer including a radiopaque agent onto the surface of the impression material.

41. (New) The method of claim 33, wherein the radiopaque agent included in the dental impression material is any of barium sulfate, calcium carbonate, calcium chloride, sodium carbonate, magnesium sulfate, bismuth trioxide, bismuth subcarbonate, bismuth oxychloride and the heavy metal powder tungsten, gold, platinum, or silver.

42. (New) A dental impression system configured to improve the quality of scanned data from a dental impression, the system comprising a dental impression material and a dental tray, the tray made of a material, each of the impression and tray materials having a respective radiopacity, at least one of the materials being formulated with a radiopaque agent such that the respective radiopacities of the materials approximately match each other.

43. (New) The system of claim 42, wherein the radiopacity of the dental tray material is formulated to match the radiopacity of the dental impression material.

44. (New) The system of claim 42, wherein the radiopacity of the dental impression material is formulated to match the radiopacity of the dental tray material.

45. (New) The system of claim 42, wherein the radiopacity of the dental tray does not exceed the radiopacity of the dental impression material by more than 50%.

6

SV 346093142v1 1/19/2007

PAGE 7/16 * RCVD AT 1/19/2007 8:39:29 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/14 * DNIS:2738300 * CSID:650 328 8508 * DURATION (mm-ss):04-16 .

46.   (New) The system of claim 42, wherein the dental tray material is formed from a thermoplastic resion, and wherein radiopacity of the dental impression tray is adjusted by compounding a radiopaque agent into the thermoplastic resin.

47.   (New) The system of claim 42, wherein the radiopaque agent included in the dental tray material is any of barium sulfate, calcium carbonate, calcium chloride, sodium carbonate, magnesium sulfate, bismuth trioxide, bismuth subcarbonate, bismuth oxychloride and the heavy metal powder tungsten, gold, platinum, or silver.

48.   (New) The system of claim 42, wherein the dental impression material is an elastomeric material, the elastomeric material being any of an irreversible hydrocolloid, a reversible hydrocolloid, a polysulfide, a polyether, a condensation reaction silicone, or an addition reaction silicone, and wherein the radiopacity of the impression material is adjusted by directly compounding a radiopaque agent into the impression material.

49.   (New) The system of claim 42, wherein the dental impression material is an elastomeric material, the elastomeric material being any of an irreversible hydrocolloid, a reversible hydrocolloid, a polysulfide, a polyether, a condensation reaction silicone, or an addition reaction silicone, and wherein the radiopacity of the impression material is adjusted by applying a layer including a radiopaque agent onto the surface of the impression material.

50.   (New) The system of claim 42, wherein the radiopaque agent included in the dental impression material is any of barium sulfate, calcium carbonate, calcium chloride, sodium carbonate, magnesium sulfate, bismuth trioxide, bismuth subcarbonate, bismuth oxychloride and the heavy metal powder tungsten, gold, platinum, or silver.

51.   (New) A digital model of a dental impression, the model of improved quality, the digital model comprising scanned data from a dental impression system, the system including
       a dental tray adapted to hold an impression material, the dental tray made of a tray material, each of the impression and tray materials having a respective radiopacity, at least one of the materials being formulated with a radiopaque agent such that the respective radiopacities of the materials approximately match each other;

7

SV 346093142v1 1/19/2007

PAGE 8/16 * RCVD AT 1/19/2007 8:39:29 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/14 * DNIS:2738300 * CSID:650 328 8508 * DURATION (mm-ss):04-16

a radiation source;

a scintillator to receive the radiation from the radiation source; a radiation detector coupled to the scintillator;

a rotatable table positioned between the radiation source and the scintillator, the table being adapted to support the dental tray with the impression of the patient's teeth; and

a computer coupled to the detector to generate the digital model with scanned data.

8

SV 346093142v1 1/19/2007

PAGE 9/16 * RCVD AT 1/19/2007 8:39:29 PM [Eastern Standard Time] * SVR:USPTO-EFXRF-3/14 * DNIS:2738300 * CSID:650 328 8508 * DURATION (mm-ss):04-16